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was difficult. Confusing cases did occur, presenting symptoms and eruptions which were not distinctive yet suggestive of either disease.

Whether the present outbreak started from imported cases or from those previously existing in Porto Rico, can not now be determined. The disease had existed so long a time previous to discovery and so many persons had been attacked, that it was not possible to trace it back to its origin.

The general vaccination under the early military government attempted to include the entire population of the island, but unquestionably thousands of persons managed to avoid it. During the succeeding years more or less vaccinations were done, sometimes many thousands, but the increase of population by birth and immigration has exceeded the number of vaccinations, hence there has been a varying but constant increase in the number of persons nonimmune to smallpox, which number has further been augmented by those whose immunity conferred by vaccination has gradually worn off.

PUBLIC HEALTH ADMINISTRATION IN NEBRASKA.

By CARROLL FOX, Surgeon, United States Public Health Service.

The following report gives the results of a study of public health organization and administration in the State of Nebraska, carried on through a period of approximately six weeks from March 15, 1916, to May 1, 1916.

Nebraska has an area of 76,808 square miles, contains 93 counties, and had a population on July 1, 1915, estimated at 1,258,624. There are but two large cities in the State—Omaha, with an estimated population of 163,200, and Lincoln, with an estimated population of 46,028. The eastern part of the State is by far the most populous. The principal industries are grain and cattle raising, and to a lesser extent dairying. Manufacturing is of minor importance.

During the course of the study the following places were visited: Omaha, Lincoln, Grand Island, Hastings, North Platte, Kearney, Seward, Columbus, and Ashland.

For information and assistance obtained during the study the writer is indebted to the various State and local officials and others interested in the subject of the public health.

THE STATE BOARD OF HEALTH.

Composition of the board.—The State board of health is composed of the governor, the attorney general, and the superintendent of public instruction. The governor is ex officio chairman and the superintendent of public instruction is secretary of the board.

Meetings.—The board meets upon the call of the chairman. A majority constitutes a quorum.

Powers and duties of the board.—The powers and duties of the board of health are as follows:

To have supervision and control over all matters relating to sanitation and all quarantine necessary to prevent the spread of communicable diseases.

To formulate, adopt, and publish reasonable rules and regulations to promote sanitation throughout the State and prevent the introduction or the spread of disease.

To adopt and enforce special quarantine and sanitary regulations in emergencies, or when the local board of health fails or refuses to act, or where no board has been established. Under such circumstances, the necessary expenses must be defrayed by the locality.

To make careful inquiry into the causes of the various communicable diseases, epidemic and endemic, and to take prompt action to suppress them.

To make careful studies relative to the sanitary condition of localities, employments, the personal and business habits of the people, and the relation of the diseases of the lower animals to man, and to promulgate the necessary regulations to protect the people against the diseases of lower animals.

To collect and preserve such information as may be useful in the discharge of its duties and for dissemination among the people.

In addition to the above the board of health is empowered to license and inspect maternity homes, to grant certificates to practice medicine; to inspect the equipment and methods of teaching in all medical colleges and schools within the State and to refuse to examine graduates of any school which it may judge not up to standing; and to grant licenses to practice dentistry after the applicants have been examined by a board of examiners composed of dentists appointed by the board of health. The State board of health is also required to appoint a board of examiners for embalmers.

It is the duty of all local, municipal, and county boards of health, health authorities, officers of State institutions, police officers, sheriffs, constables, and all other officers and employees of the State or of any locality, and every person, to observe and enforce the regulations promulgated by the State board of health. For violation there is provided a fine of not less than \$5 nor more than \$200.

The State medical board.—Inasmuch as the State board of health consists of State officers not necessarily versed in sanitary matters, there is authority in law for the appointment of a State medical board made up of four physicians, each having had at least seven years' consecutive practice within the State. Two of these physicians

must be appointed from the so-called regular school, one from the so-called homeopathic, and one from the so-called eclectic school. They receive their appointment from the governor and are entitled to reimbursement from the fees collected from applicants for license to practice medicine.

Duties of the secretaries or members of the State medical board.—It is the duty of the secretaries to assist and advise the board of health, to summon witnesses, and to take testimony and report such testimony, together with advice and recommendations, to the board of health. It is also their duty to hold examinations for license to practice medicine under rules and regulations prescribed by the board of health.

Finally, they are required by law to advise, assist, and act under the direction of the board of health in the performance of such duties as relate to communicable disease.

Discussion.—Under the constitution of the State of Nebraska, all State boards must be composed of elective officers of the State. The State board of health is, therefore, a lay board comprised of State officials who lay no claim to any special knowledge on the subject of public health. For this reason the idea was conceived to create a board composed of physicians who could act as advisors to the State board of health. It seems, however, that it was not thought necessary to provide for a State health officer with special qualifications to act as executive officer of the board of health. In the absence of such a position, the advisory State medical board, whose members are known under the law as secretaries, has assumed the details of administration. Because of its professional character, and therefore greater knowledge on public health matters, it has to a certain extent assumed the duties of the board of health, and thus at present the executive of the State board of health is in reality a board of four officials. This is a cumbersome arrangement and results in a subdivision of authority and responsibility not conducive to efficiency.

The system of a board within a board is not in accordance with modern ideas. Furthermore, the members of the advisory board live in different parts of the State and meet at infrequent intervals. Their secretary, to whom they have delegated the authority to represent them in official matters, does not live in Lincoln and, therefore, can not keep in close touch with the subordinates of the board of health who are carrying on the active work.

Many misunderstandings and deficiencies occurring in the health organization can be traced to the absence of an executive head. In order to increase efficiency and bring the State board of health on a plane with similar organizations elsewhere, it is necessary, there-

fore, to provide for a full-time State health officer to act as executive officer of the board of health. Such a man should have had previous experience in public health work; he should have administrative ability; and he should retain his position as long as he rendered efficient service to the State. In this way all responsibility would be assumed by one experienced individual. It is suggested that an examination for State health officer be held before the secretaries and the board of health, the applicant securing the highest mark to be appointed to the position by the State board of health.

At the same time certain divisions in the health department should be organized to carry on special duties, each division to have a full-time chief to act as the immediate assistant to the State health officer. As the latter would be required to assume the responsibilities of administration and enforcement of laws and regulations, his assistants should be appointed by the State board of health upon his recommendation. These bureau chiefs should hold office during efficiency and not be discharged on account of political considerations.

The State medical board should be retained as the medical examining board. It should also act in a purely advisory capacity when called upon for advice by the board of health or the State health officer.

To bring this reorganization about and render it effective, certain of the laws would have to be amended and more money appropriated.

REGISTRATION OF BIRTHS AND DEATHS.

The registration of births and deaths is required by a law patterned very closely after the model law proposed by the Bureau of the Census. Its enforcement has been imposed on the State board of health, and two clerks, at \$840 per annum each, are engaged in the work.

Death registrations.—During 1915, 10,572 deaths were reported to the State registrar. As the population of the State of Nebraska is estimated at 1,258,624, the recorded death rate is 8.4 per thousand. This is, without doubt, too low. In order to arrive at a figure more closely approaching the true death rate, figures for 10 of the principal cities of Nebraska have been computed for the calendar year 1915, and an average calculated which may be looked upon as the approximate urban death rate for the State as a whole. The results given in the following table show an average death rate of 12.1. It is believed to be not unfair to assume that the death rate for the State as a whole is probably at least 12 per thousand.

City.	Population estimated as of July 1, 1915.	Number of deaths.	Death rate per 1,000 inhabitants.	Number of births.	Birth rate per 1,000 inhabitants.	Number of stillbirths.
Omaha	163,200	1,828	11.2	2,864	17.5	139
Lincoln	46,028	610	13.2	1,169	25.3	41
Grand Island	12,519	191	15.2	244	19.4	7
Hastings	10,873	158	14.5	334	30.7	6
Beatrice	10,137	142	14.0	127	12.5	5
Fremont	9,770	112	11.4	185	18.9	4
Norfolk	7,096	89	12.5	130	18.3	2
York	6,786	67	9.8	92	13.5	2
Kearney	6,486	126	19.4	191	29.4	3
Columbus	5,760	75	13.0	136	23.6	4
Total	278,655	3,398	12.1	5,472	19.6	213

Deaths in State institutions and stillbirths have been excluded in the calculation.

Preventable deaths.—Of the 10,572 deaths, 5,056 or 47.8 per cent, were due to causes that might have been prevented. The number of deaths from these diseases, together with the death rate per 100,000 population, is shown in the following table:

Total preventable deaths in entire State, calendar year 1915.

Recorded cause of death.	Number of deaths.	Death rate per 100,000.
Pneumonia	962	76.6
Tuberculosis, pulmonary	481	38.3
Tuberculosis, other forms	59	4.7
Influenza	202	16.0
Typhoid fever	109	8.6
Measles	106	8.4
Diphtheria	91	7.2
Whooping cough	87	6.9
Scarlet fever	54	4.3
Tetanus	17	1.3
Septicemia (puerperal included)	106	8.4
Meningitis (tuberculous excluded)	67	5.3
Erysipelas	30	2.3
Diarrheas and enteritis	258	20.5
Bronchitis	71	5.6
Other infections	97	7.7
Malignant growths	698	55.6
Accident	472	37.6
Lead poisoning	1
Pellagra	1
Rickets	5
Causes peculiar to early infancy	1,082	86.2
Total	5,056

Deaths of infants under 1 year of age for year 1915.

Recorded cause of death.	Number of deaths.	Per cent of total deaths under 1 year.
Pneumonia.....	246	14.7
Diarrhea and enteritis.....	137	8.2
Whooping cough.....	59	3.5
Measles.....	30	1.7
Influenza.....	24	1.4
Meningitis (tuberculous excluded).....	20	1.1
Erysipelas.....	8	
Tetanus.....	3	
Scarlet fever.....	1	
Tuberculosis.....	6	
Poliomyelitis (infantile paralysis).....	3	
Cerebrospinal meningitis.....	1	
Syphilis.....	5	
Other infections.....	33	1.9
Premature birth.....	365	21.8
Congenital debility.....	154	9.2
Convulsions.....	42	2.5
Other causes, mostly preventable.....	469	28.1
Unknown.....	63	
Total.....	1,669	

Infant mortality.—Of the total deaths, 1,669 occurred in infants under 1 year of age. Practically all of these deaths might have been prevented. This figure represents 33 per cent of the total preventable deaths. The recorded infant mortality rate for the State during 1915 was 64.2.

Birth registration.—The total number of births registered in the State during 1915 was 25,963, giving a recorded birth rate of 20.6 per thousand.¹

Discussion.—In order to bring the State up to the standard required by the United States Census Bureau, some intensive work is required. The increased activities would be necessitated both in the office and in the field and would require an additional force, including a full-time statistician who could devote part of his time to investigations of the efficiency of registration in different localities, and an additional clerk, thereby permitting a more careful check on reports received, as well as a more extensive statistical study of material on hand.

When a locality is visited, reports of births and deaths in local newspapers and church and cemetery records should be consulted. The names of persons, obtained in this way, should be compared with the certificates received in the health department. Consultations should be had with local officials, physicians, and other citizens, deficiencies determined, and these persons encouraged by instruction and explanation to take a personal interest in securing more efficient birth and death returns.

¹ In making all of the above computations stillbirths have been excluded.

In order to increase the registration of both births and deaths, it is suggested that the cooperation of the ministers should be obtained, so that they might use their influence with the parents in having a birth or death certificate submitted where it had not already been done, whenever officiating at a christening or a funeral.

In remote parts of the State it likewise might be well to make those undertakers who have the confidence of the health department subregistrars, giving them the authority under certain conditions to issue burial permits, afterwards reporting to the nearest local registrar.

It might likewise be well to require all persons or firms dealing in coffins to report a sale to the State board of health, giving the name of the deceased.

There is a plan in use in certain other States which it might be well to adopt in Nebraska, when the office force is large enough to perform any increased work. This consists in issuing to the parents a receipt for every birth certificate received, thus giving them a record which they can preserve and which will encourage them to make sure that a birth report has been forwarded by the proper person.

EPIDEMIOLOGICAL ACTIVITIES.

The epidemiological activities of the State board of health are carried on by the State health inspector, who has also been made responsible for the efficiency of the birth and death registrations and, to a certain extent, the activities concerned with the maintenance of the purity of water supplies and the disposal of sewage within the State. This official is appointed by the board of health from three applicants nominated in writing by not less than three members of the State medical board. He must be a graduate physician of skill and experience. His term of office is one year, and he is subject to removal for cause after a hearing before the State board of health. He receives a salary of \$1,800 per year.

Report of Diseases.

Requirements of law.—The following is a summary of the law requiring the notification of diseases:

It is the duty of all boards of health and of all physicians in localities where there are no health authorities, or where such health authorities fail to act, to report to the State board of health promptly the existence of Asiatic cholera, yellow fever, smallpox, scarlet fever, diphtheria, typhus fever, typhoid fever, and such other communicable diseases as the State board of health may from time to time specify.

For violation there is provided a fine of not less than \$10 nor more than \$100 for each offense.

Requirements of regulations.—The following diseases are declared notifiable:

Anthrax.	Whooping cough.
Chicken-pox.	Dysentery, amebic and bacillary.
German measles (rötheln).	Cholera, Asiatic.
Glanders.	Diphtheria (membranous croup).
Measles.	Epidemic sore throat.
Mumps.	Poliomyelitis.
Ophthalmia neonatorum.	Scarlet fever (scarlatina).
Puerperal septicemia.	Smallpox.
Rabies.	Bubonic plague.
Trachoma.	Cerebrospinal meningitis.
Tuberculosis.	Typhus fever.
Typhoid fever.	

It is the duty of every physician attending a person supposed to be suffering from any of the above-named diseases to report in writing within 24 hours the name and residence to the local health officer.

Where a physician is not in attendance, it becomes the duty of the owner or agent of the building in which the patient resides or the head of the family in which the disease occurs to report as above.

It is also the duty of all superintendents or other persons in charge of hospitals, institutions, or dispensaries, of school-teachers, of proprietors of hotels, boarding and lodging houses, of nurses or persons in charge of camps to report the presence or the supposed presence of any communicable disease to the local health officer.

It is likewise the duty of physicians or persons in charge of milk-producing farms or creameries to report immediately to the local health officers the presence of any case of cholera, diphtheria, amebic and bacillary dysentery, epidemic cerebrospinal meningitis, septic sore throat, measles, scarlet fever, smallpox, or typhoid fever occurring in the establishment; and the health officer is required to report immediately to the secretary of the State board of health by telephone or telegraph the existence of such disease, together with all facts relative to the isolation of the case, and to give the names of persons and the locality to which such dairy products are delivered.

Physicians or others are required to report the occurrence of a number or group of cases of food poisoning to the State board of health and to the local health officer. The local health officer is also required to report as above to the State board of health.

Discussion.—The reports of cases of communicable diseases occurring during 1915, as filed in the health department, are grossly deficient. Heretofore physicians in the State have been required to report their notifiable diseases directly to the State board of health. Recent regulations, however, require that these reports be made to the local health officer, who in turn must transmit a quarterly summary of these reports to the State board of health. This means that reports received will be too old to be of any value, except for purely statistical purposes. It would be better to have the local health officer transmit the original morbidity reports as soon as he has obtained all of the information from them that he may need for immediate action.

It is true that physicians and others are required to report an outbreak of disease immediately, but in order that the health department may carry on efficient work, it should be cognizant of the first case, so that prompt prophylactic measures may be taken and an epidemic prevented.

It should be needless to say that a prompt report must be made by physicians of all cases of notifiable diseases. This is an obligation which the practicing physicians owe to their community, but one which many of them do not seem to realize.

The Control of Diseases.

Requirements of the law.—The laws relating to the power of the State board of health to promulgate regulations for the purpose of controlling the communicable diseases have already been mentioned.

In addition to these laws there is one which authorizes the State board of health to prohibit the use of the common drinking cup in public places, vehicles of common carriers, etc., and provides a fine of not to exceed \$25 for the violation of such regulations.

Requirements of regulations.—These regulations are comprehensive, yet notably deficient in that no mention is made of the necessity for vaccination in the case of smallpox.

They cover the subjects of the exclusion from school and public gatherings of persons suffering from certain diseases; the exclusion from school and public gatherings of well members of the family; the responsibility of parents and guardians under such circumstances; quarantine; the precautions to be taken by physicians; terminal disinfection; the submission of cultures from cases of diphtheria; the exemption of adult members of the family from quarantine; the removal of cases of communicable diseases; the removal of infected articles; the right of entry and inspection; the care of the discharges; special precautions; placarding and interference with placards; maximum periods of incubation; minimum periods of isolation; the sale, distribution, or handling of foods; cleansing, renovation and disinfection of rooms and articles; disinfection of the person; forbidding the renting of rooms while contaminated with infected material; duties of common carrier; the placarding of common carriers; the duties of undertakers; forbidding public funerals in certain diseases, and the sanitary maintenance of camps.

In addition, there are some special regulations promulgated for the purpose of preventing the spread of tuberculosis. These provide for the reporting of tuberculosis to the local health officer, who is required to transmit to the attending physician a printed statement specifying the precautions that must be taken to prevent the spread of the disease. After the attending physician has taken all these precautions he is entitled to a fee of \$1, to be paid by the locality.

It is required that registrars report promptly to the health officer the name and address of every person reported to have died of tuberculosis. If it is found that no report of the case has been made, his attention must be called to the provisions of the regulations; after repeated violations, local authorities are required to take the necessary steps to enforce the penalty provided. The

regulations also provide for the examination of sputum, the protection of records and the disinfection of premises, prohibit the occupancy of any apartment or premises until the disinfection has been accomplished, and provide a penalty of not to exceed \$10 in case a person is careless or refuses to comply with the precautions necessary to prevent the spread of the disease. Where physicians fail to perform the duties required by the regulations, or make false reports, they may be subjected to a fine of not to exceed \$100. Physicians are also required to report the recovery of a case to the local health officer. In addition to the penalty already mentioned, there is another providing a fine of not less than \$5 nor more than \$50 for violation of certain of the provisions.

The tuberculosis sanatorium.—The State maintains an institution for the care of the tuberculous. Both advanced and incipient cases are taken. At present its maximum capacity is approximately 40 patients, who are housed in a well-designed wooden pavilion, containing two wards, one for male and one for female patients. There will soon be ready for occupancy a brick building, which will increase the capacity of the sanatorium to approximately 100 patients. There is likewise under construction a power plant to furnish heat and light.

There is also a small tuberculosis pavilion in connection with the county hospital of Douglas County. It is too small for the purpose.

It is needless to state that the facilities for isolating cases of tuberculosis within the State are entirely inadequate and it is suggested that steps be taken to interest the different counties in building sanatoria in which to place tuberculous patients who are a menace to the health of the community.

Discussion.—To a large extent the duties of the State health inspector are concerned with the settlement of disputes among physicians over diagnoses and of disagreements among the local officials as to how certain diseases should be handled under the regulations. The amount allowed by the legislature for traveling expenses incurred by officials of the State board of health is entirely inadequate and would not permit of any intensive work being carried on for the control of disease. Nor could one man properly perform the comprehensive duties of the office even though the fund for traveling expenses were sufficiently large to enable him to be on the road at all times. Furthermore, one man could not be expected to be an expert on the three important subjects of epidemiology, sanitary engineering, and vital statistics.

On account of the inadequate force in the board of health and lack of funds, the enforcement of regulations must necessarily be left to the local health officers. Except in a few instances, however, local health organizations are very deficient. In order to get results, it is necessary, not only to reorganize and enlarge the State board of health, but to require that each county and city be provided with a

health organization which could render active assistance to the State officials. A study of the table already given will show that much active and intensive work is necessary in the interest of the public health. This table represents but approximately 70 per cent of the deaths that actually occur from preventable causes. If one could add the unreported deaths as well as those due to syphilis and other communicable diseases reported under other heads, the number of deaths from preventable causes would be shown to be much greater. The greatest number of deaths of this nature were due to pneumonia, a disease quite common in Nebraska, especially among the very old and the very young. Next in the number of deaths is malignant growths, followed by tuberculosis. Influenza, or a disease resembling it and reported under that name, occasioned 202 deaths, many of them in the aged and complicated by pneumonia. Smallpox is all too common, due to the fact that general vaccination is not practiced. The ordinary communicable diseases, as for instance scarlet fever and diphtheria, are quite prevalent.

Occupational diseases play a very minor part in the public health problems of the State.

Diagnostic Laboratory.

The bacteriological laboratory of the State board of health was established in 1913. Previous to that time the necessary work had been performed in the laboratory of the State University at Lincoln.

In the laboratory there is employed one bacteriologist, at a salary of \$2,400 per year; he has no assistant. Much of his time is taken up with the examination of water supplies. In addition to this examinations are made of cultures in the case of diphtheria both for diagnosis and for release from quarantine; of sputum for the diagnosis of tuberculosis; of blood for the Widal test in case of suspected typhoid; and of animal heads for suspected rabies. Some clinical laboratory work is carried on, as for instance the examination of urine and gastric contents, and examinations for both the food and drug commissioner and the State veterinarian.

Method of procedure.—Approved mailing outfits are supplied to physicians and health officers upon request. Those in use for the diagnosis of diphtheria contain a tube of blood serum, a wooden tongue depressor, and two swabs. Those for the diagnosis of tuberculosis contain a stoppered wide-mouth bottle with a small quantity of carbolic-acid solution. Wright's capsules are furnished for the submission of blood specimens for the Widal reaction; but, as is so often the case, physicians do not seem to understand their use, and finally resort to the drop of blood on a glass slide in order to secure a specimen suitable for examination. Two outfits are furnished for

forwarding water samples to the laboratory, one to be used when chemical analysis is desired and one for bacteriological examination.

The laboratory is well equipped, and examinations are made in a scientific manner.

Discussion.—A study of the following table will show that physicians are taking but little advantage of the laboratory facilities offered by the State. On the other hand, it should be said that there is as much work carried on in the laboratory as may reasonably be expected from one man. Previous to April, 1915, the bacteriologist had an assistant who received \$1,000 per year and who relieved him of much of the routine work, as, for instance, the cleansing and sterilization of glassware, preparation of media, etc.; but the position has since been abolished. It is not economy to use the time of a skilled employee to perform duties that could as well be done by a less skilled and lower paid man. Such an arrangement also interferes with the scientific work which the bacteriologist should be required to do.

If the State is to take its place in the front rank in public health matters, it is necessary that the amount of work performed in the laboratory be greatly increased and its scope broadened. Physicians should be encouraged to send in more specimens, and facilities should be extended to physicians and health officers so that they could have Wasserman reactions determined, as well as the examination of tissues or tumors for suspected malignancy.

Mailing outfits for the submission of specimens for examination should be supplied to conveniently located distributing stations in different parts of the State, so that physicians could secure them without delay.

There should be employed not only a bacteriologist to perform the diagnostic work but a chemist to take over the examination of water and sewage analysis and a laboratory attendant to perform that part of the routine work required preparatory to making investigations.

It should not be necessary for either the bacteriologist or the chemist to carry on correspondence, which in a properly organized health department would be attended to by the sanitary engineer and the epidemiologist.

The forms for reporting the results of diagnoses should be of the same size as the morbidity report cards, so that positive reports of diagnosis could be filed with the epidemiologist in lieu of morbidity reports.

Daily reports should be made to the epidemiologist, giving the location from which positive specimens were received.

It is suggested that too much stress is laid on the importance of the chemical analysis of water, which, moreover, takes a great deal

of time. The most important point to determine is the presence or absence of colon bacilli. Because of local conditions, it may be necessary for the present to continue chemical analysis of water, but with the proper organization and the formation of a bureau of public health engineering, such examinations need only be made when considered necessary by the sanitary engineer after a sanitary survey.

The cost of maintaining the diagnostic laboratory during 1915 was \$2,975.46, making a cost per examination of \$1.36. It may be safely assumed that the purely diagnostic work of the laboratory should be increased at least tenfold. Excluding water analysis, the work would then amount to 13,790 examinations, with an increase of only \$1,340, \$840 of which would be spent for a laboratory assistant and \$500 for maintenance. This would reduce the cost per examination to 31½ cents.

Tabulation of examinations made in the laboratory of the State board of health, calendar year 1915.

	Positive.	Negative.	Total examinations.	Unsuitable for examination.
Water:				
Chemical.....			144	
Bacteriological.....			480	
Ice:				
Chemical.....			88	
Bacteriological.....			88	
Milk (human), bacteriological.....			2	
Cerebrospinal fluid.....			13	
Milk (cows), bacteriological.....			127	
Milk (human), chemical.....			40	
Widal reactions.....	78	153	231	22
Diazo reactions.....	46	23	69	
Rabies.....	5	32	37	
Diphtheria, cultures.....	62	169	231	27
Tuberculosis, sputum.....	103	225	328	2
Malaria.....	2	6	8	
Vaccines:				
Antityphoid.....			46	
Autogenous.....			1	
Miscellaneous.....			232	
Feces.....			14	
Total.....			2,179	51

Local Health Authorities.

Requirements of laws.—In municipal corporations the law provides for the creation of a board of health to consist of the mayor, the city physician, the president of the city council, and the marshal. This board is authorized: To make and enforce necessary regulations relating to matters of health and sanitation, including the control of communicable diseases, control of hospitals, sanitation of streets, vacant grounds, stockyards and the like, and wells, cisterns, privies, cesspools, stables, and other places that may become offensive; to abate or prevent the occurrence of nuisances; and to enforce all State laws relating to health and sanitation. The jurisdiction of the board of health ex-

tends 5 miles beyond the city limits. Penalties are provided for the violation of such regulations.

The board of trustees of villages is authorized by law to appoint a board of health to consist of three members, one of whom shall be a competent physician. This board is authorized to enforce the quarantine laws in the village and to have jurisdiction 3 miles beyond the village limits. Where a board of health is not created, the board of trustees is vested with the powers and duties of a board of health and is required to enforce the regulations of the State board of health. The members of the board of health hold office for one year, unless sooner removed by the president of the board.

County boards are required to establish a board of health, one member of which shall be a legally registered physician. Such boards have jurisdiction throughout the county except in incorporated cities and villages having the power to establish boards of health and quarantine regulations. The board is required to make and enforce regulations to prevent the introduction and spread of communicable diseases. Where no board has been established, it is the duty of the county board of supervisors, or commissioners, to enforce the quarantine laws and regulations of the State board of health.

Requirements of regulations.—Local health officers are required to make quarterly reports as to general sanitary conditions and the presence of disease. They are also required to keep in close touch with the diseases existing within their jurisdiction and, if necessary, to notify the State board of health of conditions. They shall report to the State board of health any deficiency in birth and death registrations occurring within their respective districts, or any violation of the vital statistics act. They are required to investigate water supplies, sewerage systems, public buildings, and conditions of places where nuisances are liable to arise, and to make report from time to time to the State board of health upon the results of such investigation. All conditions needing an investigation must be immediately reported by them to the State board of health. They must obey such directions as may be given them by the State board of health. At least once every year, or as often as is deemed necessary, local health officers are required to meet when called by the State board of health for conference on public health matters.

The only cities having health departments worthy of the name are Omaha and Lincoln. Their organizations are described as follows:

Omaha.—The city of Omaha is under a commission form of government. One of the commissioners is known as the commissioner of police sanitation and public welfare. The department of health is under the control of a health commissioner, who is directly responsible to the commissioner of police sanitation and public welfare. The commissioner of health receives \$3,000 per annum and is permitted to do outside practice.

The medical work required for the control of communicable diseases is performed by the commissioner and two medical assistants who are part-time men; one receives \$125 and one \$100 per month. The methods practiced in the control of these diseases are based on modern ideas. The city is fortunate in having an isolation hospital for the common communicable diseases, as well as one for the isolation of smallpox. At one time the former was a large residence,

which has been remodeled to suit the purposes and is conveniently located near the business section of the city. It will, if necessary, accommodate 75 beds.

There are employed one chemist at \$1,800 per annum and one bacteriologist at \$1,800 per annum, both part time. The laboratory work is performed in the laboratories of the Creighton Medical College in Omaha, the city health department having no laboratory facilities of its own.

There is but one inspector employed in the milk-inspection division. He is required to inspect 85 near-by dairies, as well as perform the city work. The ordinance requires that all milk must be sold in the original package and must be either obtained from tuberculin tested cows or pasteurized. The tuberculin test is given once a year. The inspector has obtained some excellent results among the dairies selling raw milk as regards cleanliness of barns, milk houses, and animals, construction of concrete floors, use of small-topped milk pails, proper drainage, ventilation, etc. He has acted on the principle that expensive equipment is unnecessary, provided the principles of cleanliness are practiced. That good results have been obtained is proved by the bacteriological findings, the average on all samples for the year being approximately 37,000 bacteria per cubic centimeter.

There is, however, too much work for one man to do, and the inspector should be given an assistant for city work, so that he could devote more of his time to the inspection of dairies.

In the work of sanitary inspection, there are employed one restaurant inspector; one bakery and confectionery inspector; one sanitary plumbing inspector, whose special duties are to inspect places having old installations or using the surface privy; one sanitary inspector engaged in fumigating and placarding for communicable diseases; one meat inspector who looks after the sanitation of meat markets; two slaughterhouse inspectors who make ante and post mortem inspections of animals killed in slaughterhouses not under Government supervision; one clerk whose duty is to issue burial permits; and two clerks for general purposes.

The collection of garbage is under the control of the health department. From the residence sections it is collected once a week in winter and twice a week in summer, and from wholesale houses, hotels, and restaurants once a day throughout the entire year. Garbage is disposed of by feeding it to swine on a ranch located near the city. For the present this seems to be a satisfactory method and costs the city of Omaha nothing. By maintaining proper sanitary conditions on the ranch there should be no nuisance produced.

Rubbish is collected under private contract. It has been used for filling in low and insanitary places in the city limits, but on account

of complaints it was stopped and a new method used, which it is thought may not prove as satisfactory. Rubbish which of itself has little value becomes valuable when used to fill low, marshy land, since otherwise useless land may be reclaimed and nuisances such as mosquito-breeding areas done away with. If no garbage is deposited with the rubbish this practice should not be objectionable.

There is no adequate system of health supervision of schools in Omaha. It is highly desirable that such be inaugurated as soon as possible and placed in the health department for reasons of efficiency and economy.

During 1915 the health department received \$31,500 for public health work, and for 1916 the appropriation amounts to \$35,000. For the collection of garbage \$33,000 was expended during 1915. In addition to this there was an appropriation of \$7,000 for the maintenance of the isolation hospital.

The water supply for the city of Omaha is obtained from the Missouri River. It passes through six sedimentation basins and is treated by alum as a coagulant and by chlorine. The process furnishes good water, as determined by laboratory tests which are made daily by chemists employed by the city water department. A close check is also kept on the process of purification. The city is well sewered. The sewage passes into the Missouri River untreated.

Lincoln.—The health department of the city of Lincoln is engaged in the following activities: Collection of birth and death certificates, milk inspection, control of communicable diseases, including operation of isolation hospital, meat inspection, food inspection, sanitary inspection, gas inspection, inspection of weights and measures. The two latter activities have nothing to do with public health and should not be included in the work of a health department.

There are employed a full-time superintendent of health, who receives \$1,800 per year; a clerk, who is in charge of the birth and death reports, at \$780 per year; a deputy superintendent, who performs the necessary bacteriological work and the duties of a city physician (\$1,200 per year); a visiting nurse, at \$840 per year; two sanitary inspectors, one at \$960 per year and one at \$840; a food inspector, at \$960 per year; a meat inspector, who is a veterinarian and who receives \$1,200 per year; and an inspector who has charge of the inspection of milk and dairies and acts as the inspector of gas, weights, and measures (\$900 per year).

The amount received by the health department during 1915 was \$13,430, a sum inadequate properly to support a health department in a city of the size and importance of Lincoln. The health department is therefore handicapped in not having a sufficient number of employees to carry on its activities. All of the employees are full time.

The health department is a part of the department of public safety, presided over by a commissioner. There is also a board of health, composed of the mayor, commissioner of public safety, and four physicians, including the superintendent of health.

The visiting nurse is concerned in the control of communicable diseases. She exercises some health supervision over the children of the parochial schools, acting as school inspector as well as school nurse in such schools. She also visits families having newborn infants and instructs and supervises the work of the midwives of the city. The number of nurses should be increased to not less than three in order that they may perform all of the work which is usually required of them according to modern ideas, including prenatal work, child welfare, school hygiene, and the prevention of communicable diseases.

The city is fortunate in having an isolation hospital which will accommodate 35 patients.

School inspection, except for that already mentioned, is under the control of the educational department. This should be combined with the health department for efficiency as well as for reasons of economy.

Garbage is at present being collected under contract and dumped. The city is now contemplating the construction of an incinerator.

The water supply is obtained from deep wells and is treated with hypochlorite. Daily examinations show it to be of good quality.

The city is sewered and the sewage passes into a creek untreated.

Other cities.—In addition to Omaha and Lincoln there were visited the cities of Columbus, Grand Island, North Platte, Kearney, Hastings, Ashland, and Seward.

There is a health officer in all of these communities, but in no instance has he been furnished with any assistants.

Hastings has a small isolation hospital constructed of brick. On account of an outbreak of smallpox, Grand Island has rented temporarily a building. In a few instances, as for instance Kearney, the health officer is performing some laboratory work in his own laboratory. None was exercising any supervision over the milk supply. All the cities were supplied with water from bored wells, furnishing a water of a satisfactory nature and requiring no treatment. All were sewered and, with the exception of Hastings, disposed of their sewage untreated into rivers, creeks, or sloughs. Hastings uses a septic tank, the effluent passing into pits, where it evaporates and percolates through the soil, which is afterwards plowed. The plant is faulty in design in that for a part of the time the sewage must pass direct to the pits without passing through the tanks. Garbage is dumped. The collection of vital statistics in these communities seems to be satisfactory. All of the health officers

were more or less actively engaged in the proceedings required under the regulations to control the communicable diseases.

Each of the cities visited could well afford to furnish a public health nurse and a milk inspector to assist the health officer. The need for a State sanitary engineer was apparent in practically every community.

PUBLIC HEALTH ENGINEERING.

Requirements of laws.—The only law providing for the maintenance of the purity of water supplies is summarized as follows:

Whoever obstructs the course of any river or stream, thereby making an artificial pond or producing stagnant water which is injurious to the public health, is liable to a fine of not to exceed \$500, and the board is authorized to order such nuisance abated or removed.

It is prohibited to put any dead animal or part thereof or other filthy substance into any well or running water which is used for domestic purposes.

For violation there is provided a fine of not less than \$2 nor more than \$40.

Requirements of regulations.—The only regulation applying to the maintenance of the purity of water supplies is summarized as follows:

No person or corporation is permitted to furnish to any person or corporation for domestic purposes any water which has been condemned by the State board of health or from a source of supply which has been condemned, unless such water has been purified by some method approved by the State board of health, or unless the condemnation has been removed.

Discussion.—As in other States, many communities have problems of water supply and sewage disposal the solution of which has an extremely important bearing on the public health. There is no expert in the health department to assist communities in working out these problems. The bacteriologist devotes a great deal of his time to the analysis of water upon request of local officials, but much of this work, which is done without a knowledge of local conditions, is unsatisfactory and futile unless the results obtained are utilized in a practical manner by one with a thorough knowledge of the subject. It is highly important that there be organized in the health department a bureau of public health engineering in charge of a capable sanitary engineer, who could advise and assist local officials at the expense of the State. In rendering this assistance it would be necessary to make a survey to determine the requirements, draw up tentative plans, and inform the authorities as to the approximate cost. It would then be necessary for the sanitary engineer to exercise general supervision over the work of the contractors in order to determine whether or not the community was getting all that it was paying for. As has been pointed out in other reports, it is a common thing to find a small city supplied with a sewerage

system or a system of water supply entirely inadequate to meet the needs of the community and not giving the results that were to be expected. Such a condition as this could be easily avoided by securing the proper advice from the State sanitary engineer before any decision was made. In time it would be advisable to enact a comprehensive law giving supervisory control to the State board of health of all water supplies, public and private, sewerage systems, garbage-disposal systems, and systems for the disposal of trades wastes. As soon as possible a chemist should be added to the staff of the State board of health to perform the water and sewage analyses under the direction of the sanitary engineer.

DISSEMINATION OF INFORMATION.

A bulletin is published quarterly by the State board of health, containing articles and information which are of especial interest to the health officials of the State. This bulletin, however, is of little value as popular reading, and literature of such character is lacking. Circulars that would be of benefit to the laymen should be published without delay, to cover the subjects of typhoid fever, measles, whooping cough, diphtheria, tuberculosis, disposal of sewage, flies, etc.

As soon as the funds will permit, it is also suggested that a public health exhibit be acquired and shown in the different communities of the State, to be accompanied by lectures with moving pictures or lantern slides for the education of the people. It must be kept in mind that to bring the activities of the health department to a successful issue it is most essential to carry on an energetic educational campaign along the lines of public health.

Every year there is held a meeting of local health officers with the State health officials to discuss questions of public health interest. This is an excellent idea, and provision should be made by law whereby those attending the meeting could be reimbursed for traveling expenses by the locality which they represent.

HEALTH SUPERVISION OF SCHOOLS.

In a few of the cities there is maintained a system of health supervision of schools. This is very superficial and is in the hands of educational authorities rather than the health department. The public health nurse, as part of this system, is given minor importance as compared to the physician, whereas the reverse should be the case. It should not be necessary to point out the great value of the nurse in public health work and the advantages to be gained, both as to efficiency and economy when the health supervision of schools is made a part of the work of the health department.

In time it would be wise for the State board of health to organize a bureau of child welfare to take up the activities concerned with infant welfare, school hygiene, and the supervision of midwives in localities not already carrying on such activities.

THE CONTROL OF THE MILK SUPPLY.

The enforcement of the laws enacted for the maintenance of the purity of milk and dairy products has been placed in the hands of the commissioner of food, drugs, dairies, and oils. In this office there are employed 16 inspectors throughout the year and an additional 6 during the summer months. Some of these inspectors are given regular districts in which they carry on all of the activities pertaining to the office of the commissioner, while some are detailed to perform certain specific duties.

In addition to a supervision of the milk supply not only on the producing farm, but at creameries and all other places handling milk, inspectors are also required to enforce those regulations relating to the maintenance of sanitation in places selling, preparing, or handling food products.

A few of the cities have employed inspectors to maintain the purity of milk furnished to their citizens, but the great majority have not thought this necessary, although large enough to take an active part in this important health work.

It is quite impossible for the State to exercise the control over the milk supply that is needed without some assistance from the locality. It is suggested that the health department, with a proper organization and some necessary field men, would be able to cooperate with the food and drug commissioner and assist him in enforcing the regulations promulgated for the purpose of maintaining the cleanliness of the milk supply.

APPROPRIATIONS AND EXPENDITURES.

Expenditures.—The itemized expenses incurred by the State board of health during 1915 are presented in the following table:

Tabulation of expenditures, State board of health, calendar year 1915.

	State medical board.	General adminis- tration.	Epidem- iology.	Vital statist- ics.	Educa- tional.	Diagnos- tic labor- atory.	Total.
Antitoxins and vaccines.....						\$35.00	\$35.00
Badges.....			\$1.00				1.00
Binding.....				\$80.25			80.25
Books.....			5.00			1.50	6.50
Drugs, chemicals and disinfectants.....			1.65			49.74	51.39
Dues to societies and associations.....		\$10.00					10.00
Express and freight.....	\$0.63			3.05	\$5.28		8.96
Gas and electricity.....						33.92	33.92
Ice.....						14.13	14.13

Tabulation of expenditures, State board of health, calendar year 1915—Continued.

	State medical board.	General adminis- tration.	Epidem- iology.	Vital statist- ics.	Educa- tional.	Diagnos- tic labor- atory.	Total.
Installation of equipment.....						\$7.35	\$7.35
Laboratory supplies.....						19.80	19.80
Licenses to practice.....	\$24.70						24.70
Maps.....			\$4.40				4.40
Miscellaneous.....		\$3.55	.75				4.30
Office furniture.....				\$40.25			40.25
Office supplies.....	1.25		2.50	107.35			111.10
Printing.....			21.50	292.17	\$411.30	5.50	730.47
Rent.....					15.00		15.00
Repairs to furniture.....			1.00	11.50			12.50
Salaries:							
Medical officers.....			1,800.00				
Bacteriologist.....						2,400.00	
Clerks.....	120.00			1,680.00			3,249.90
Laboratory attendant.....						249.99	
Stamps, postage, and revenue.....	43.00		1.00	179.80	15.72	50.00	289.52
Stationery.....	71.06		19.25	113.60	56.58	39.05	299.54
Telegraph and telephone.....	30.97	\$7.35	22.89			69.48	210.69
Traveling expenses.....			280.88		6.30		287.18
Typewriters and repairs.....				88.90			88.90
Total.....	291.61	100.90	2,161.82	2,596.87	510.18	2,975.46	8,636.84

Appropriations.—There were appropriated to the State board of health for the biennial period 1915 and 1916 the following amounts:

Salary of a State health inspector.....	\$3,600
Salary of a stenographer.....	1,680
Salary of a clerk.....	1,680
Salary of a bacteriologist.....	4,800
	<hr/> \$11,760
Incidentals, books, blanks, etc., for State board of health.....	5,500
Traveling expenses.....	500
Books, blanks, stationery, telephone, etc., for laboratory.....	2,000
	<hr/> 8,000
Total.....	<hr/> 19,760

This total is equivalent to \$9,980 per annum.

There was collected by the State during 1915 in general taxation the sum of \$2,934,981.59, which, with a balance from the previous year, \$70,571.33, makes a total income from this source of \$3,005,552.92. Computing the amount that should go to public health on the 2 per cent basis, it will be seen that the State board of health would have received \$58,699.62 per annum. At the end of the year 1915 there was a balance of \$132,314. If the amount mentioned above had been appropriated to health work, there would still have been \$73,614.59 remaining in the Treasury. The total amount of money collected by the State from all sources, plus the balance from the previous year, was \$7,244,498.60. There was expended during the same period \$6,753,207.87, leaving a balance at the end of the year of \$1,284,008.82. The amount actually received by the State board of health represents but thirty-three one-hundredths of 1 per cent of the amount available

through general taxation, a sum entirely inadequate to meet the public health needs of the State.

Following out the suggestions that have been made in this report, there would be required for the present an annual appropriation of \$24,700 to be used in the maintenance of the health department, including salaries. The employees who are required under the plan of reorganization and who are to be paid out of the above amount include a State health officer or executive officer of the board of health, an epidemiologist to be chief of the bureau of epidemiology, a sanitary engineer to be chief of the bureau of public health engineering, a statistician to be chief of the bureau of statistics, a bacteriologist, a laboratory attendant, and four clerks and stenographers.

There are six new positions created, viz, the State health officer, the sanitary engineer, the laboratory attendant, and three clerks and stenographers. The position of epidemiologist is now represented by that of the State health inspector, and this position should be done away with and that of epidemiologist, or chief of the bureau of epidemiology, created and filled by promoting the State health inspector. The position of statistician is now represented by that of vital statistics clerk. It might be created and filled by the promotion of the one occupying the position of clerk. The position of bacteriologist is already provided for.

Larger quarters for the State health organization should be provided in the capitol, as the amount suggested above would be inadequate were the extra expense of rent to be incurred.

MISCELLANEOUS.

Hotel inspection.—The laws enacted for the purpose of maintaining sanitary conditions in hotels and providing for the safety and comfort of guests have been placed for their enforcement in the hands of a deputy hotel commissioner, who has an inspector to assist him. It would seem wise to place the hotel inspection under the board of health, thus making available to that body an additional field force which could, in addition to hotel inspection, inspect other conditions in the communities visited.

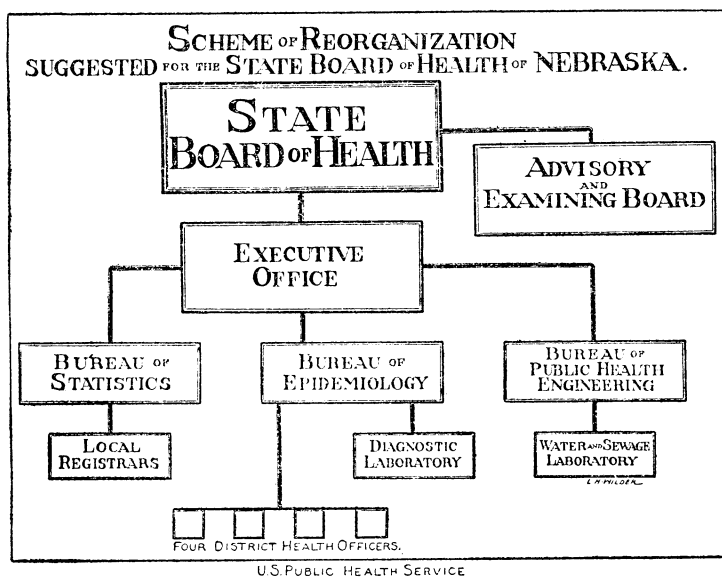
The orthopedic hospital.—In addition to other State institutions there has been established an orthopedic hospital, which is of more or less interest from the public health standpoint, inasmuch as its purpose is to correct deformities and thus make useful citizens out of children who might otherwise be charges upon the community during adult life. The work of the hospital, however, is more of a relief than of a public health nature and must, therefore, be considered as such an institution.

RECOMMENDATIONS.

After a thorough study of the State board of health and careful consideration of the public health needs of the State, the following recommendations are offered:

1. That the name of the State health organization be changed to the State department of health.

2. That a full-time State health officer to act as executive officer of the board of health be appointed by the State board of health, at a salary of not less than \$3,000 per annum; that the State health officer be a physician with previous experience in public health work, and that he hold his office as long as he renders efficient services to the State; that he receive his appointment only after passing a com-



petitive examination before the board of health and the advisory board.

3. That the State department of health be organized into the State board of health, the executive office, a bureau of epidemiology, a bureau of public health engineering, and a bureau of statistics.

4. That the bureau of epidemiology be placed in charge of a full-time epidemiologist, to be appointed by the State board of health upon the recommendation of the State health officer, that he hold his position as long as he renders efficient service to the State, and that his salary be not less than \$2,500 per year.

5. That a full-time sanitary engineer be placed in charge of the bureau of public health engineering, that he be appointed by the board of health upon the recommendation of the State health officer

at a salary of not less than \$2,000 per annum, and that he hold his office so long as he renders efficient services to the State.

6. That a full-time registrar be placed in charge of the bureau of statistics, that he be appointed by the State board of health upon the recommendation of the State health officer, at a salary of not less than \$1,200 per annum, and that he hold his office as long as he renders efficient service to the State.

7. That the position now designated State health inspector be changed to that of chief of the bureau of epidemiology.

8. That in addition to the above the personnel of the State department of health be increased by the addition of one laboratory attendant and at least three clerks.

9. That all of the employees of the health department be full time and hold their office during efficiency.

10. That the bureau of epidemiology be made responsible for the collection of information regarding the prevalence of disease and for the enforcement of the State laws and regulations relating to morbidity reports, the control of preventable diseases, the work of the diagnostic laboratory, and the supervision of the activities of local health authorities.

11. That the bureau of public health engineering be made responsible for the activities concerned in the maintenance of the purity of water supplies, the disposal of sewage, garbage, and trades wastes, and the laboratory work entailed in the analysis of water and sewage.

12. That the bureau of statistics be made responsible for the registration of births, deaths, marriages, and divorces, and the compilation and tabulation of data relating thereto.

13. That the laboratory be divided into two parts, the diagnostic and the water and sewage laboratory; that the former be made a division of the bureau of epidemiology and the latter a division of the bureau of public health engineering.

14. That the work of the laboratory be extended both in amount and in scope so that the physicians and health officers of the State may have greater facilities to assist them in the diagnosis of communicable diseases.

15. That energetic efforts be made without delay to secure the notification of reportable diseases and complete birth and death registration.

16. That educational literature on the different subjects of public health be published by the State board of health and distributed among the citizens of the State.

17. That a public health exhibit be acquired by the State board of health and exhibited in the different communities of the State, accompanied by lectures and moving pictures.

18. That the advisory board be retained as an examining board and in a purely advisory capacity—i. e., to give advice when called upon by the State board of health but to have no administrative or controlling function.

19. That the advisory board meet jointly with the State board of health upon the call of the president of the board of health.

20. That not less than \$24,700 per annum be appropriated to the State board of health to be used in the following manner, at the discretion of the State board of health:

	Per annum.
1 State health officer, at not less than.....	\$3, 000
1 epidemiologist, at not less than.....	2, 500
1 sanitary engineer, at not less than.....	2, 000
1 bacteriologist, at not less than.....	1, 800
1 registrar, at not less than.....	1, 200
1 laboratory attendant.....	840
4 clerks and stenographers, at \$840.....	3, 360
Maintenance of health department, including traveling expenses, laboratory expenses, printing, etc.....	10, 000
Total.....	24, 700

21. That larger quarters for the State department of health be provided in the statehouse at Lincoln.

22. That a record of the expenditures be kept by the State department of health, according to the nature of the expense and the bureau incurring it, so that the cost of maintaining any bureau, or the cost of any activity, may be determined without delay.

23. That the regulations of the State board of health be amended to provide for vaccination against smallpox.

The above recommendations are made for the purpose of placing the State health organization in Nebraska on a par with the health organizations of other States having progressive State health departments, as well as to provide an adequate organization for carrying on the public health work immediately required. This will require some legislation.

In addition to the above it will be necessary to add to this organization in the future, and for this purpose the following recommendations are made:

24. That as soon as practicable a chemist be employed to be placed in charge of the water and sewage laboratory under the direction of the sanitary engineer.

25. That the State be divided into not less than four districts, each district to have a full-time district health officer, who must be a physician with previous experience in public-health work, and to receive not less than \$1,800 per annum; that district health officers be made responsible to the State health officer and the epidemiologist

26. That in order to defray the expenses of the district health organization, including the salary of the district health officers and assistants, and necessary traveling expenses, there be appropriated the sum of \$20,000, or \$5,000 for each district.

CALIFORNIA.

Cities.	Col- lected.	Ex- amined.	Found infected.
San Francisco.....	149	117	(1)
Oakland.....	9	9	(1)
Total.....	158	126	(1)